

THE PUPATION OF *CALOPTERON TERMINALE*
(SAY) (COLEOPTERA: LYCIDAE)

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ABSTRACT

Prior to pupation, the larva of *C. terminale* attaches its caudal end in a vertical position to a suitable substrate. The larval cuticle splits along the dorsolateral margins and the pupa remains within the exuvium. Duration of the pupal stage is 1 week.

Larvae of the netwinged beetle, *Calopteron terminale* (Say), were collected in the W. K. Kellogg Forest in Kalamazoo County, Michigan on 9 July, 1971, as they crawled over the exposed surface of a moist decaying fallen oak log. This species apparently works its way from beneath bark of decaying logs where it has spent its larval stage to seek a place in the open environment for pupation. Exuviae and pupae have previously been observed on the exposed surface of logs, leaves, and other forest litter.

Several larvae were placed in a covered plastic container with a small amount of decaying wood, moist leaves, and soil, and kept at room temperature. The discussion that follows is based upon observations of these larvae and the ensuing pupae.

Prior to pupation, the larvae attaches its caudal end in a vertical position by a secretion (apparently from the proleg-like tenth abdominal segment). The secretion hardens to a clear cement-like substance. The larva remains in this quiescent prepupal stage from 2 to 4 days. Then the cuticle splits along each dorsolateral margin, usually from the head to the seventh abdominal segment. The entire exuvial dorsum remains attached at the caudal 3 or 4 abdominal segments and sometimes also at the head.

The pupa (Fig. 1) has an elongate body, 11-16 mm long, dirty white in color with some brown. *Head*: small and inconspicuous, partially covered by the pronotum; antennae prominent with numerous minute tubercles on the lateral and apical margins of segments 3-11.

Pronotum: with 6 elongate tubercles (4 along the anterior border which are directed anteriorly, and 1 on each of the posterior angles which is directed vertically). *Mesonotum*: with 2 small subcylindrical tubercles, their length subequal to their width, situated mesally on the posterior edge. *Metanotum*: with a single mesally located protuberance.

Abdomen: segments 1-8 (using the abdominal terminology of Rozen 1959) bear 4 tubercles (1 lateral marginal tubercle and 1 pleural tubercle on each side). The hook-shaped pleural tubercles become progressively shorter from the first to the eighth abdominal segment. The degree of hooking is much less pronounced in the tubercles on the last few segments. The ninth abdominal segment gives rise to elongate, posteriorly directed, apically hook-like urogomphi. The hook-like apices are covered with large numbers of very minute spine-like protuberances.

The quiescent pupa remains within the exuvium. The hook-like apices of the urogomphi are attached by a cement-like substance to the inner



Fig. 1. Ventral view of the pupa of *Calopteron terminale* (Say).

exuvial wall of the ninth and tenth abdominal segments. Adults emerged 6 to 8 days later, commonly in 7 days.

By remaining within the larval exuvium as a pupa, *C. terminale* is afforded many of the same protective advantages as those of a pupal case, pupation under bark, or in a leaf. The adult is also able to circumvent the necessity of chewing its way from beneath the bark of a log. The rapacious mandibles of the adult are far more suited for the capture of prey and are morphologically incapable of chewing.

LITERATURE CITED

- ROZEN, J. G. 1959. Systematic study of the pupae of the Oedemeridae (Coleoptera). *Ann. Ent. Soc. Amer.* 52:299-303.